DIVISION OF RESEARCH AND INNOVATION

I-TEAM BRIEF

The Innovation Team (I-Team) at the Caltrans Division of Research and Innovation, in cooperation with its partners, develops proven, ready-to-deploy innovations in methods, materials, and technologies that enable Caltrans to provide the most effective management of public services, resources, and infrastructure.

JUNE 2010

Updated: October 2010

Continuous Risk Profile

*A new method of identifying collision hot-spots using the Web-based interface **Roadway Safety Analysis***

Caltrans continuously analyzes the traffic collisions that occur along its roadways in order to identify sites that might require further safety improvement. Many freeway sites have been improved due to this effort. However, Caltrans understands that the current procedure, called the Sliding Moving Window method, has room for improvement. For example, the Sliding Moving Window method has high false positive rate and often identifies sites that are adjacent to each other. ***The Caltrans I-Team supported the development of the Continuous Risk Profile (CRP) method for improved collision data analysis, and the Roadway Safety Analysis (ROSA) Web-based interface to make the use of CRP convenient and easy.***

READY TO DEPLOY

The CRP approach improves the averaging of collision data over the current method. Rather than using a "discrete" approach—averaging data at each segment—CRP uses a "continuous" approach, averaging data at each spot. This approach eliminates small fluctuations while capturing gradual changes in risk throughout the highway, and represents risk reality much more accurately.

NEW AND IMPROVED

- Reduces false positive rates, allowing Caltrans to better utilize its resources by reducing the number of unnecessary onsite safety investigations.
- Graphically produces an easy-to-interpret true risk profile along an extended freeway segment.
- Does not limit the segment length in analyzing traffic collision data, thus effectively capturing the spill-over benefit of a countermeasure to the adjacent sites.
- Can proactively detect sites that display a systematic increase in collision rate over time.
- Employs the ROSA Web-based interface, which was custom-designed to make evaluating traffic collision data with CRP convenient and easy for safety engineers and planners.
- ROSA uses the same input information as the current system.
- ROSA allows users to specify a time period so safety engineers can analyze a segment of freeway over a selected period of several years or several hours.

About Continuous Risk Profile

CRP and its Web-based interface ROSA were developed by engineers in District 4 and researchers at Institute of Transportation Studies at the University of California, Berkeley (ITS Berkeley), as an alternative to the existing Sliding Moving Window method used by Caltrans. Both methods use existing Caltrans traffic collision data for input but use different approaches to analyze the data. The current pilot is being administered by the California Center for Innovative Transportation, a research center at ITS Berkeley.

GET STARTED

Contact:
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Learn More

The Continuous Risk Profile Approach for the Identification of High Collision Concentration Locations on Congested Highways, Koohong Chung et al.
http://www.escholarship.org/uc/item/24m8j57d

Caltrans I-TEAM BRIEF

SUCCESSES

- Based on the enormously positive findings of the early research, CRP is expanding its data from two Caltrans districts to a pilot with much larger pool of data from regions across the state.
- Currently, safety managers from nine out of the twelve Caltrans districts have joined the pilot.
- If results of the pilot and other follow-up evaluations further verify CRP's accuracy and value, Caltrans will work to recognize it as an official method for determining high collision concentration locations (HCCL) on state highways.

METRICS

A study conducted on 413 miles of Northern California freeway compared the accuracy of the Continuous Risk Profile and the Sliding Moving Window methods. The study found that the CRP method:

- ➤ Reduced false positive rate by 35%.
- ➤ Increased to the accuracy rate (true positive) by 300%.
- ➤ Increased annual cost savings by 562%.
- ➤ Would have increased cost savings by $4.7 million if the Continuous Risk Profile method had been used instead of the Sliding Moving Window method.

GET READY

ROSA is located at http://www.safetrec-demo.berkeley.edu/rosa/ and is accessible by authorized users only.

To become an authorized user, you must be part of the pilot. To join the pilot, contact your district manager or call Steve Andrews (see Get Started).

On-site trainings are being conducted throughout the state. Call the number listed under "Get Started" to attend.